Developing and manipulating business models applying system dynamics approach
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Abstract
Purpose – Considering the significant necessity of organization’s conformity with environmental changes and also the importance of predicting the result of managerial decisions, this research has been accomplished with the purpose of designing a dynamic business model. In today’s ever changing business environment, the simulation of different decision making scenarios is obligatory for managers in order to create the possibility of studying the effects of decision results on business model (BM) components, interrelation of component and total benefits in an organization. Therefore, the purpose of this paper is to take advantage of the dynamic system approach as an operational, quantitative and flexible approach for business model simulation.

Design/methodology/approach – Based on this purpose, related literature was thoroughly reviewed and proportionate with the level of study and research approach, Business Model Ontology (BMO) was chosen. The model designed using the system dynamics approach and its structure was evaluated via expert judgment. In the next step, some scenarios were developed and executed to confirm the behavior of the model and also to evaluate the importance of applying the dynamic approach in business model simulation.

Findings – These results show that decision making for a BM change leads to complexities and dynamic behavior of business components and also other actor reactions which are usually nonlinear and complex. In this regard this paper suggests dynamic simulation utilization to predict and analyze the results.

Originality/value – The system dynamic approach has precedents in business studies; however, this research makes this approach operational in BM design and analysis.

Keywords Decision making, Modelling, Business Model, Simulation

Paper type Research paper

1. Introduction
Appropriate business model (BM) for organizations would be a competitive advantage in today’s complex world and ever-changing business environment. Actually, this model represents the way in which an organization could make a value for its customers to pay money for its products or services (Turban et al., 2002). Although, everyone talks about BM, but 95 percent of people has neither a clear and complete idea nor a framework about their BM and as a result, they are not able to have appropriate and effective relationships inside or outside of their organizations (Pateli and Giaglis, 2002). Voelpel et al. (2004) believes that it is absolutely important for organizations to have a correct, clear and common view of their BM and its building blocks, because this matter would be a source of competitive advantage for organizations and helps them to rebuild themselves. Lai et al. (2006) debate that BM effects explain performance

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heterogeneity more than even industry effects do and it is important to concentrate on this concept both in business and by academics. Although the BMs of firms with comparable positions may appear similar, there are fine-grained differences both in their activities and in their value formation and this differences make some businesses more competitive and prosperous (Sainio et al., 2011).

Each organization has a BM that simply shows the “method of running the business” or “organization business concept” (Hamel, 2000). In the more recent literature on BMs, the concept is referred to as a design or architecture with the notion of value creation at its core. For instance, Smith et al. (2010, p. 450) define BM as the design by which an organization converts a given set of strategic choices into value, and uses a particular organizational architecture in order to create and capture that value. Similarly, Teece (2010) describes the BM as the design or architecture of value creation, delivery and capture mechanisms. New BM creations and innovations are actually necessary for surviving in an environment, that “game rules” are revolving continuously and it is considered as a requirement for achieving disruptive competitive advantages. In this case, developing a framework of investigating the way in which the new business is created would be a great challenge (Voelpel et al., 2004). Although the BM improvement process has its own risks, organizations mostly choose to improve and develop current strategies. However, innovation in BM is vital and also difficult; a lot of problems and limitations are due to the change of current BM (Chesbrough, 2010). It is indispensable to have a dynamic managerial approach to design a BM. Therefore, in designing a BM, instead of a static approach, which is suitable for BM typology and performance, managerial BMs alteration should be in question and dynamism has to be considered from the design phase (Demil and Lecocq, 2010). Additionally, the BM has been referred to as a dynamic concept, which allows trial-and-error learning, adaptation and renewal as the external environment changes (Sosna et al., 2010; Chesbrough, 2010; Doz and Kosonen, 2010). In accordance with environmental or internal requirements, BM change needs quantitative, flexible and dynamic approach. This approach facilitates observing the effects of decisions on model’s building blocks and their relations. The benefits would be operating altered BM, leading to added values. Moreover, the effect of changing one of BM building blocks on the other components and actors are disposing tools to evaluate the effect of decisions in BM.

Accordingly, the main purpose of this research is to apply system dynamic approach in studying and simulating a BM to predict its changes and new scenarios’ implementation consequences. In fact, we aim to attract academic and practitioners attention to the necessity of considering casual relationship between BM building blocks especially in strategic decision making and scenario planning. System dynamic approach as an operational tool could be used in BM design and modification by both managers and analysts to realize casual relations more attentively. Deciding about BM change or manipulating its building blocks by senior managers discarding the eventual effects on other components is prevalent in real world. This approach would leads to unpredicted effects on other related concepts of business logic that may influence on value proposition negatively. Therefore, the principal intention of current research is to investigate if SD approach is feasible and applicable in BM conceptualization and manipulation. In this regard we tried to map BM building blocks based on SD development and simulation rules besides considering the logical relationship between BM core components. The structure of this research is as follows.
First, the BM concept is explained with a selected BM framework; then, system dynamics implications in business study is described; in the next section a system is designed in order to demonstrate the potential of this technique; finally, the research results are discussed throughout scenario implementations.

2. Business model

Researches about BM have been developed during the time. Although, researchers have not relied on other studies, a marked sequence could be seen on paper works in this area. At the beginning, the period of time in which the phrase “BM” was spreading all around, some writers represented BM definitions and categories. Then, researchers supplemented the previous works by proposing BM components. Thereafter, BM components have been analyzed in detailed and accurate manner and writers started to simulate these components conceptually. These research works leaded to reference models and analogies. Subsequently, models were evaluated and tested thoroughly and they have been applied in management and information system cases (Osterwalder et al., 2005).

In 2002, Margareta defined BM as a description of company’s performance method while Weill and Vitale (2001) believe BM is a description of roles and relationships among consumers, customers, partners and suppliers of the company. In their paper, BM is indicated as a key factor of production, information and financial flow as well as partners’ benefits. Peterovic et al. (2001) and Auer and Follack (2002) expressed BM as a description of business system logic for value creation. From Turban’s viewpoint (2002) this model represents how a company could propose a suitable value that customers propend to pay for products and services. Osterwalder et al. (2005) consider the BM as nothing but the value that company offers to one or several segments of customers and the architecture of the firm and its partners network who make an attempt for creating, marketing and delivering this value and relationship capital.

Different descriptions and explanations about BM have been represented by researches categorized in the following hierarchy (Osterwalder, 2004):

1. BM as an abstract and generic concept.
2. Schema of an abstract classification of different BMs explaining businesses with common properties.
3. Concepts or aspects of special BM in real world.

These three categories are different in their modeling details including simple description to list of components as a set of different building blocks. The hierarchical relation of these categories is shown in Figure 1.

Considering the purpose and nature of this research, the first level would be adaptable because this research is aimed at providing manipulation of BM concepts as a generic model. In the other word, BM in this paper is an abstraction that describes a business not at the operational level, but at the conceptual level. Among well-known BMs, BM ontology (BMO) focuses on relationships among the components which are necessary for dynamic modeling. BMO includes four building blocks:

1. Product. What is the business of organization and which products and values are offered to market?
2. Customer interface. Who are target customers and how sustainable relationship with them could be appointed?
(3) **Infrastructure management.** How does the organization handle its infrastructure and procurement related activities and how does it work as a network?

(4) **Financial aspects.** What is the revenue model and business cost structure of organization?

In this approach, BM is ultimately a blueprint or a recipe that fulfils important functions such as enabling description and classification. It allows us to build typologies and study the relationship between a given BM and performance. From the managerial point of view, it gives a consistent picture of the different BM components and how they are arranged, which can then be communicated and understood. This stream helps to describe how an organization functions and generates revenues and assists managers to conceptualize the different activities their company employs to generate value and its mechanisms for value creation.

The second use of the concept represents a transformational approach, where the BM is considered as a concept or a tool to address change and focus on innovation, either in the organization, or in the BM itself. In this approach, a sustainable BM is rarely found immediately, but requires progressive refinements to create internal consistency and/or to adapt to its environment and deals with this major managerial question, and thus can help managers reflect on how they can change their BMs (Demil and Lecocq, 2010).

In this study we aim to conceptualize the second approach using system dynamic, so the definition of BM is as follow in this study.

A BM is a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams. In fact, based on selected framework (BMO) the main components of BM are defined in Table I.
3. System dynamics implications in business studies

System dynamics is a methodology for studying and managing complex feedback systems, which one finds in business and other social systems. In fact, it has been used to address practically every sort of feedback system.

Following advantages are mentioned for SD in business (Thurbly and Chang, 1995):

- SD analyzes not only for company’s processes, but also its policies.
- SD applies system thinking approach to study the entire business system rather than studying only problematic processes.
- SD helps in establishing business control metrics and quantifying.

Systems become increasingly more complex and this makes it more difficult to conceptually design their behavioral model. Therefore, the concept of using “Microworld” is developed to analyze some of pre-defined variables in order to understand system behavior. Creation, modification and manipulation of “Microworld” increase our knowledge about the systems we live in, work or stop working with (Woodside, 2006).

SD approach has been previously used in similar business studies. It has been applied in order to study the effect of business reengineering in a research. This article begins with introducing business reengineering concepts and continues with the description of SD application, modeling and studying the result of simulated sample in a business reengineering project (Burgess, 1998). In another research, SD is used to analyze the process of strategy development in organizations. In this investigation, system thinking and simulation has been applied as a tool to manage the complex and dynamic process of formulation, evaluation and implementation of strategies (Fowler, 2003). SD is also used to evaluate the organization’s values during investment financing and dividend policies.

<table>
<thead>
<tr>
<th>Pillars</th>
<th>BM building block</th>
<th>Description</th>
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<tbody>
<tr>
<td>Product</td>
<td>Value proposition</td>
<td>Gives an overall view of a company’s bundle of products and services</td>
</tr>
<tr>
<td>Customer interface</td>
<td>Target customer</td>
<td>Describes the segments of customers a company wants to offer value to</td>
</tr>
<tr>
<td></td>
<td>Distribution</td>
<td>Describes the various means of the company to get in touch with its customers</td>
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<tr>
<td></td>
<td>Relationship</td>
<td>Explains the kind of links a company establishes between itself and its different customer segments</td>
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<tr>
<td>Infrastructure management</td>
<td>Value configuration</td>
<td>Describes the arrangement of activities and resources</td>
</tr>
<tr>
<td></td>
<td>Core competency</td>
<td>Outlines the competencies necessary to execute the company’s BM</td>
</tr>
<tr>
<td></td>
<td>Partner network</td>
<td>Portrays the network of cooperative agreements with other companies necessary to efficiently offer and commercialize value</td>
</tr>
<tr>
<td>Financial aspects</td>
<td>Cost structure</td>
<td>Sums up the monetary consequences of the means employed in the BM</td>
</tr>
<tr>
<td></td>
<td>Revenue model</td>
<td>Describes the way a company makes money through a variety of revenue flows</td>
</tr>
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Source: Osterwalder et al. (2005)
change (Qureshi, 2007). It is also used in order to simulate the environmental changes and their effect on business (Bleda and Shackley, 2008). In another research, a dynamic product development model is developed to reduce product development cycle times, slippages and costs as well as improvement of perceived product quality (Pesonen et al., 2008). Other scholars have applied SD in balanced scorecard (BSC) to foresee the time lag dimension of different types of indicators and their combined dynamic effects (Nielsen and Nielsen, 2008). Purnomo and his colleges (2009) used system dynamics to mimic the value chain of teak from forest to final furniture market using phases of conceptual design to model uses. In another case, a system dynamic model is presented, which considers the feedback between supply and demand and oil revenue of the existing system in Iran considering different sectors of the economy (Kiani and Pourfakhrabeib, 2010).

Consequently, applying this approach for business modeling would be appropriate and may help managers to find out the result of different decisions.

4. System development

In order fulfill the research purpose; we developed dynamic BM based on BMO in Magfa (www.magfa.com). This case has been studied for acquisition information in the current state and also prediction of critical variables behavior under the influence of changes and modifications of some of other model variables. Magfa is a technology based company which provides different products and services in ICT sector. One of their services is e-learning that propose electronic content and infrastructure particularly for organizations. It offers a chance to achieve a new online teaching method by providing an electronic learning management system (LMS). In fact, offering electronic courses to schools and providing them with technical support is the basic mission of e-learning unit. The products and services of this unit are as follows:

- Providing training centers with supporting services in special, practical and advance courses in digital format.
- Preparing modular, practical and advanced courses for universities on internet.
- Providing a LMS to offer courses on internet.
- Offering technical support, during the courses which includes daily seminars and training for the teachers, trainers and learners in order to use the electronic LMS:

Board of directors has to decide about application of mobile platform in service providing in order to provide tools for higher productivity and efficiency in Magfa. In fact, mobile technologies have been successfully applied in forerunner organizations. In many cases, mobile applications not only lead to positive aspects such as better performance, improvement in consumption pattern, effectiveness in sales department and modifications in customer service, but also accelerate accessing data and facilitate decision making (Liang and Wei, 2004).

In order to simulate the current BM of Magfa, the business logic which is mainly based on preparation and offering of electronics courses, was identified. Also, the main products and general capabilities regarding designing and preparation of electronic courses as well as regular updating of these courses have been investigated. An examination was made of the production method, offering and selling the services, the method of dealing with customers and presenting the products through training centers and universities.
Ultimately, the revenue models and the main expenses were studied. According to the fact that the increasing development of wireless technologies is diminishing all the limitations of time and distance in the presentation and transferring of information, there would be an opportunity of applying mobile technology for educating people at any time and place. Since the revenue model in electronics course looks at absorbing more and more trainees and more use of electronics courses, and regarding the fact that in today’s business world many people have to commute to do their daily work, by removing the distance limitation for using the courses, more operators can make use of Magfa services and consequently the company’s revenue model would take more variety and the revenues would rise up. Based on this assumption the simulation process of Magfa BM has been started to survey if managers’ expectation about income rise by using mobile technology would be proved.

So, the main managerial question is “if applying mobile technology in e-learning department of Magfa lead to higher value to customers?” In following sections, we describe system development process and model verification.

4.1 System development process
There is no unique instruction to follow making sure that designed model is successful. Indeed, modeling is basically an innovative process and there are different methods and approaches to design a dynamic model (Sterman, 2000). In this research, following logical steps have been applied in modeling.

The purpose of modeling would be representing the BM based on BMO foundation and BM simulation in an organization considering the changes and complexities in environment; necessary and challenging as well. In this research, the period of modeling is considered to be 60 months (five years). This period is appropriate for business planning and also variables fluctuation depiction over time. It should be also mentioned that because of BMO rich theoretical background, the relationship between the model key variables has conformity with BMO's structure.

It is also necessary to define an assumption to be studied by the dynamics model. The theory considered in this research is:

Applying SD approach in BM simulation has an important role to take advantage of quantitative and flexible tool that could be used for evaluating managerial decisions.

Then cause and effects and stock and flow diagrams are designed. Vensim® is deployed in simulation and running the simulated model and scenarios owing to software capability in dynamic model simulation, structure definition, and behavioral model representation in different possible situations. In Figure 2 the relationship among BMO variables is shown.

4.2 System structure and behavior verification
Relied on BMO components and structure, the designed model consists of some important sections:

- Enterprise customers moving between the organization and its competitor. This section, actually, includes all potential customers that could be the organization customers or its competitor's.
- Organization capabilities to produce and propose values for its customers including the ability to supply customers with products based on production capability,
target supply, current supply and the gap between these two indicators. It also represents price changes pattern based on changes in demand and supply.

- Value proposition to customers which is based on the significant factors of quality and price.
- Organization suppliers which supply the necessary components for production. Based on the demand level of components, the supplier bargaining situation would be determined.

This model was designed without emphasis on competitor section, but evaluation of model in real world and based on business expert opinion; in this study the competitor section is added to the model. Although the competitor behavior is not considered in BMO, it has been added to model in order to adapt it with real world concept.

In order to fulfill the evaluation process in this research, we arranged interviews with two different groups. The first group, including seven experts, has been chosen for validation of designed model and its conformity with the SD foundation. The second group has been selected to test the performance of proposed model in action and to evaluate simulated behavior of important variables of BM. For operational evaluation, Magfa Company (Information Technology development Center) has been chosen as a case to test the model in action. The main reasons for this selection are:

- access to information for model evaluation;
- having a technology basis; and
- appropriate knowledge of managers about BM.
As validity of the results in a model-based study is crucially dependent on the validity of the model (Barlas, 1996), extreme-condition test has been used on the main variables of model to validate the model. In fact, three levels of validation have been conducted based on Forrester and Senge (1980).

5. Findings
To test the model in action and to study the behavior of different variables, the simulated model was implemented in a case that encountered a decision making situation. In fact, emerging new technology in telecommunication and data transfer, bring an opportunity to companies to reduce the cost of operation or provide better services to customers. Following scenarios are designed with the purpose of representing complexities related to decision making about BM change.

Suppose that the organization attempts to improve its value proposition element by changing in two influential factors: price and quality to increase its market share. In this case, we presumed that Magfa is planning to apply emerging technology in distance learning in order to facilitate user access to content of courses. In this regard, managers need to apply analytical tools to examine the results of different scenarios. Simulation of BM based on SD is used to investigate managerial decisions' result in different scenarios; accordingly, below mentioned scenarios have been designed and implemented in foregoing context.

First scenario – improving quality in organization[1] – providing more easily access for customer applying mobile infrastructure
In this scenario, it is assumed that Magfa is the first mover in applying emerging technology in distance learning in comparison to its competitors. Therefore, it is possible to propose higher values for customers based on providing superior quality of services. In such situation, suppose that the competitor is unable to emulate this strategy to preserve its market share, so it would apply cost leadership strategy and propose lower prices to customers. The results of running the model based on key parameters of two competitors are as follows.

Magfa can improve quality; the competitor is decreasing its profit margin in order to propose the same value for customer and to keep its market share. By increasing quality in this case, providing the facility for customers to be able to receive, review and read the content of courses on mobile phones or other devices. The result of this scenario is shown in Figure 3. It is observed that the quality shock in the first organization leads to an increase in the number of its customers. But, due to the competitor reaction in decreasing the price, the number of customers would fluctuate around a particular amount. On the other hand, the competitor reaction leads to the same average number of customers after a sudden decrease as a result of the quality shock in Magfa. To avoid more complexities in modeling, the amount of potential customers has been considered constant; therefore Figure 3 shows the behavior of customers attending to Magfa based on being the first mover providing more facilities in using learning course but due to increasing development in mobile application, competitor will be prepared to deliver the same services. Obtaining the same capabilities in service delivery by Magfa and its competitor leads to customer attention fluctuation between these two rivals.

First organization encounters an unforeseen situation due to the competitor reaction. Magfa does not achieve the planned profit after investments in quality;
therefore, managers may invest more on quality and provide more facilities for customers to reach higher profits. In this situation, as it could be seen in Figure 4, all potential customers convert to actual customers of either first organization or its competitor, due to higher values proposed by these two companies. In this case, unawareness about target customers, the number of customers or inattention to the reaction of customers to different scenarios would lead to wrong and inexact decision in an organization.

As mentioned before, in this situation, the organization expects to have a substantially increased benefit due to preeminence in quality and higher prices, but regarding to its competitor’s reaction, this would not happen. Hereon organization may decide to invest more amounts of money on infrastructure and quality, which is
obviously an incompetent decision. This decision plays not only a role in making profits, but also causes huge amounts of investment costs that could not be returned regarding lack of potential customers. As demonstrated in this scenario and its results, being inattentive to cause and effect relations in business environment and concentrate only on the direct influence of managerial decisions may redound to unanticipated outcome in business results. Applying SD approach even in simplified manner could be effective in predicting decision consequences.

Second scenario – decreasing production cost in organization: applying mobile technology in production process

In this scenario, it is supposed that organization abates the cost of production with the purpose of profit gain. In such situation, assuming constant product price in market, the profit is anticipated to increase. Organization demand for production factors increases because of sudden growth of organization production. In fact, as the case study has the power of decreasing production cost through using modern technology, the proposed price to customer decreases. This change eventuates to increase customer demand and fulfill the customer needs, so the organization has to scale its entry up. In this case, the providers who are categorized as content provider of courses, request more money to provide the increasing demand. To be more explicit, if the suppliers have more bargaining power, they make a great portion of profit due to increasing demand in organization. Lack of comprehensive understanding of suppliers, their behavior and reactions, may cause absorbing profit margin by suppliers after detracting production costs.

In this case study, Magfa lowers the production cost, using tele-working strategy and consequently it scales down the price of courses. To be more expessed, mobile technology in the second scenario could be used as a production infrastructure which let employee work in any place any time and consequently the production cost decreased. Magfa could provide its services by lower price for customers and under the influence of this change, the demand would rise and the company would be able to
provide new courses proportionally. This flow increases the demand for content of courses as production factors. Along with an increase in intermediate variable named target supply in this model, the supplier would raise the price. Considering this case, despite scrounging in production costs, prime cost and consequently benefit would not change substantially due to components increased cost. Simply stated, a noticeable portion of benefit could be transferred to supplier. Figure 5 shows the changes after implementing mentioned scenario, especially in benefit per unit and total benefit.

As shown in Figure 5 the unit profit amount would rise after a shock on production in first step, but because of suppliers bargaining power and increasing cost of production factors, unit benefit decreases. Organization may expect to gain remarkable...
profit, but the obtained profit based on cost reduction would be transferred to the supplier. Total average profit increases due to its higher value for customers and attracting more customers. To declare more, implementing this strategy for applying mobile technology, managers may expect lower cost of production, price reduction and as a logical consequence customer request summation. As an expected result, this behavior demonstrated in simulated model but the cause and effect relation between Magfa’s sale increase and its request for course material from suppliers, accumulate target supply that provokes higher cost from content providers. Hence, despite of Magfa sale and profit margin increase, after a period of time, the cost of supply augmenting absorbs considerable profit unit portion.

Results of above mentioned investigations and findings of model simulation show that decision making about BM changes is not a simple process and its results could not be simply predicted. Accordingly, the organization may invest more amounts of capital on infrastructure improvement with the purpose of business key indicators enhancement, but lack of understanding and cognition about business environment, suppliers bargaining power, customers bargaining power and competitors reaction, may lead to loss in organization due to investments in infrastructure without any utilization. Applying quantitative methods such as dynamic system approach can help managers and business analysts to design or modify their BMs. Especially system dynamic approach with a capability of testing various strategies, simulate different situations and represent the key variables behavior in a system which can help managers to gain prescience before decision making and proceed with conviction and consciousness.

6. Conclusions
The dramatic increase in the number of publications referring to the “BM” since the late 1990s and early 2000s illustrates the rise in the interest in the concept (Zott et al., 2011). The relevance of the BM, however, is not only limited to the academic debate. Recently, also practitioners have shown interest in the concept and have discovered the BM as relevant locus of innovation that goes beyond traditional product and process innovations. Considering the increasingly importance of this concept, in this study, a generic BM is developed dynamically. Then two different scenarios are designed to change and manipulate the model in order to investigate value and profit changes and fluctuations. The result of different scenarios simulation in this case study is represented. These results show that decision making for a BM change leads to complexities and dynamic behavior of business components and also other actor reactions which are usually nonlinear and complex. Developing BM concept with a simulation tools such as system dynamic may seems complicated in the first examination, but it is worthy for creating and changing BM and especially to evaluate the impact of specific changes to a firm’s value proposition. In our ever changing business environment, practitioners have to make decisions to improve attraction for their customers, obey market rule change and also implement new and emerging technologies. In the other hand, this survey clearly proves that making policy about business foundation may lead to unknown impact on other related components. This cause and effect loops could be represented by system dynamic method and then managers could be enabled to investigate different policies and decision making scenarios absolutely. Results of running the scenarios show that lack of knowledge about BM components and suppliers, customers and competitors behaviors
and capabilities could lead to unexpected results. Simulating scenarios indicate that reduction in costs or improvement in quality may cause value creation in business system, but value distribution method in business chain is relevant to many factors. As a result, business current state identification is necessary in the process of BM change. The approach applied in this research would be operational for organizations intending to change their BM or analyze their decision results in future. System dynamics approach with the susceptibility to simulation of system and representing behavior of different variables could be helpful for designing BM in an organization and examining different strategies. The ability of SD approach in scenario examination obviously is attractive for managers to see, manipulate and examine different situation results before acting in real world. Hence, the confusing process of developing the model to portray the business logic of firm is valuable enough for decision making situations particularly in BM level which affect on strategic level of business management. For further researches, the model represented in this research could be implemented and tested in different contexts. Furthermore, providing BM simulation through other reference models can be helpful for practitioners.

Note
1. Red color in diagrams represents the situation before the scenario and blue color shows changes after that. First organization is that one the scenario is taking place and second organization is the competitor.

References


Further reading


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